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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,115	07/14/2003	Michael Powers	MKPA-105US	6849

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EXAMINER	
SONG, SARAH U	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/619,115	POWERS, MICHAEL	
	Examiner	Art Unit	
	Sarah Song	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2 and 7-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2 and 7-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 26, 2005 has been entered. Claims 13 and 21 have been amended. Claims 2 and 7-26 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 2, 7-12, 18-20 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zairi et al. (U.S. Patent Application Publication 2003/0108304 previously relied upon) in view of Koh et al. (U.S. Patent 6,628,854 previously relied upon).**

4. Regarding claim 7, Zairi et al. discloses an optical component housing 90 comprising a substrate 92 having a substantially planar fiber mount region 94 and an optical component mount region adjacent to the substantially planar fiber mount region. See Figure 7A.

5. Regarding claims 7 and 8, Zairi et al. discloses an optical component housing 90 comprising a substrate 92, and a substantially planar fiber mount region 94 formed on the substrate and adjacent to an optical component mount region, but does not expressly disclose an

optical component mount aperture formed in the substrate and configured to receive an optical component therein, an optical component placed within the aperture. See Figure 7A.

6. Koh et al. discloses an optical component mount apertures 7a, 8a, 9a and 10a in an optical device substrate for providing ease of alignment. The component mount aperture is configured to receive an optical component. See Figures 2, 4 and related text.

7. Zairi et al. and Koh et al. are analogous art as pertaining to optical device substrates. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an optical component mount aperture, and the optical component 95 of Zairi et al. placed within the aperture in order to provide ease of placement of the laser of Zairi et al.

8. Regarding claim 2, Zairi et al. does not expressly disclose a substrate 92 to be selected from a group consisting of an aluminum oxide ceramic, a nickel-cobalt alloy, aluminum nitride ceramic, or silicon carbide ceramic. However, Zairi et al. discloses that the substrate may be selected from any suitable material. Aluminum oxide ceramics are well known in the art for optical device substrates and for being easily machined. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an aluminum oxide ceramic substrate in order to provide ease of manufacture.

9. Regarding claims 9 and 10, Zairi et al. discloses an optical component housing further comprising a metallic mount pad 96 formed over the substantially planar fiber mount region and configured to bond to a metal solder. Zairi et al. discloses the housing further comprising a metallized optical fiber 102 coupled to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036].

10. Regarding claims 11 and 12, Zairi et al. does not expressly disclose the fiber mount pad to be configured to bond to a glass solder. Zairi et al. does disclose that the fiber 102 may be bare, but also does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

11. Regarding claim 24, Zairi et al. discloses a high thermal conductivity base 92, a low thermal conductivity substrate 94 having a substantially planar fiber mount region therein and abutting the high thermal conductivity base with a surface at the same level as the base; and an unpackaged optical component 95 mounted on the base.

12. Zairi et al. does not expressly disclose the optical component having a top surface metallized to serve as an electrode, and an aperture in which the component is mounted.

13. Koh et al. discloses an aperture 7a, 8a, 9a or 10a in which to mount the component to provide ease of alignment.

14. Furthermore, metallized top surfaces of optical components are well known in the art for facilitating electrical connections between the device and the electrical circuitry.

15. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a metallized top surface of the device 95 of Zairi et al.

mounted in an aperture, in order to accommodate the electrodes of the device and to provide ease and accuracy of electrical connections and alignment.

16. Regarding claim 25, Zairi et al. discloses an optical component housing further comprising a metallic mount pad 96 formed over the substantially planar fiber mount region and configured to bond to a metal solder. Zairi et al. discloses the housing further comprising a metallized optical fiber 102 coupled to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036].

17. Regarding claim 26, Zairi et al. does not expressly disclose the fiber mount pad to be configured to bond to a glass solder. Zairi et al. does disclose that the fiber 102 may be bare, but also does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

18. Regarding claim 18, Zairi et al. discloses a method of forming a fiber-coupled component housing comprising the steps of: forming a substrate 92, forming a substantially planar fiber mount region 94 and an optical component mount region adjacent to the substantially planar fiber mount region. See Figure 7A.

19. Zairi et al. does not expressly disclose forming a ceramic substrate, forming an optical component mountable aperture in the substrate, and placing an optical component within the area defined by the optical component mountable aperture.

20. Koh et al. discloses forming optical component mountable apertures 7a, 8a, 9a and 10a in an optical device substrate and placing respective optical components within the area defined by the optical component mountable apertures for providing ease of alignment. The component mount aperture is configured to receive an optical component. See Figures 2, 4 and related text.

21. Zairi et al. and Koh et al. are analogous art as pertaining to optical device substrates. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an optical component mount aperture, and the optical component 95 of Zairi et al. placed within the aperture in order to provide ease of placement of the laser of Zairi et al.

22. Zairi et al. also does not expressly disclose a substrate 92 to be ceramic. However, Zairi et al. discloses that the substrate may be selected from any suitable material. Aluminum oxide ceramics are well known in the art for optical device substrates and for being easily machined. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an aluminum oxide ceramic substrate in order to provide ease of manufacture.

23. Regarding claim 19, Zairi et al. discloses the method further comprising forming a metallic mount pad 96 over the substantially planar fiber mount region and configuring said mount pad to bond to a metal solder. Zairi et al. discloses the method further comprising

securing a metallized optical fiber 102 to the metallic mount pad 96 by the metal solder 100 to optically couple the fiber and the optical component. See Paragraphs [0028], [0030] and [0036].

24. Regarding claim 20, Zairi et al. discloses a forming a fiber mount pad 96 over the substantially planar fiber mount region, but does not expressly disclose the fiber mount pad to be configured to bond to a glass solder. Zairi et al. does disclose that the fiber 102 may be bare, but also does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

25. **Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zairi et al. in view of Tada (U.S. Patent 5,684,902 newly cited).**

26. Regarding claim 13, Zairi et al. discloses an InP semiconductor substrate (¶0036), wherein the laser may be fabricated directly on the substrate, and having an optical component region and a substantially planar fiber mount region adjacent to the optical component region. Zairi et al. discloses the laser 95 comprising an optical output coupler (end facet of laser) formed on a surface, wherein the substantially planar fiber mount region is configured to permit alignment of an optical fiber in first and second directions using at least a top view and a side view (Figure 7A).

27. Zairi et al. does not expressly disclose the laser to comprise:

- a substrate formed from a semiconductor of a first conductivity type;
- an active layer selected from a group consisting of a bulk gain material and a quantum well structure formed on the substrate over the optical component region;
- a semiconductor layer of a second conductivity type different from the substrate, the semiconductor layer formed over the active layer; and
- an electrode layer of a high conductivity material formed over the semiconductor layer.

28. Tada discloses an InP semiconductor laser comprising:

- a substrate 7 formed from a semiconductor of a first conductivity type and having an optical component region and a substantially planar fiber mount region (end facet of 4) adjacent to the optical component region;
- an active layer 5 selected from a group consisting of a bulk gain material and a quantum well structure formed on the substrate over the optical component region;
- a semiconductor layer 10 of a second conductivity type different from the substrate, the semiconductor layer formed over the active layer 5; and
- an electrode layer 16 of a high conductivity material formed over the semiconductor layer.

29. Zairi et al. and Tada are analogous art as pertaining to semiconductor laser modules.

30. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the InP substrate of Zairi et al. with an integral laser as disclosed by Tada. It would have been obvious to provide the substrate 92 formed from a semiconductor of a first conductivity type; an active layer selected from a group consisting of a

bulk gain material and a quantum well structure formed on the substrate over the optical component region; a semiconductor layer of a second conductivity type different from the substrate, the semiconductor layer formed over the active layer; and an electrode layer of a high conductivity material formed over the semiconductor layer as disclosed by Tada, since Zairi et al. discloses that the laser may be fabricated directly on the substrate. One of ordinary skill would also have been motivated to provide the laser directly on the substrate to simplify subsequent alignment steps.

31. Regarding claims 14-15, Zairi et al. discloses an optical component housing further comprising a metallic mount pad 96 formed over the substantially planar fiber mount region and configured to bond to a metal solder. Zairi et al. discloses the housing further comprising a metallized optical fiber 102 coupled to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036].

32. Regarding claims 16-17, Zairi et al. discloses that the fiber 102 may be bare, but does not expressly disclose coupling the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a glass solder to bond the fiber to the mount pad in order to provide ease of manufacture. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the substrate and the glass solder.

33. **Claim 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zairi et al. in view of Tada and Doussiere et al. (U.S. patent 5,717,711 previously relied upon).**

34. Regarding claim 21, the method of forming the device would have also have been obvious for the same reasons as provided with respect to claims 13-17 as setting forth requisite steps for manufacture of the device as set forth above with respect to claims 13-17.

35. Zairi et al. and Tada do not expressly disclose an anti-reflective optical output coupler on a face of the active layer.

36. Doussiere et al. discloses a fiber-laser coupler wherein a substantially anti-reflective optical output coupler is formed on a face F1 of the active layer. See column 3, lines 14-15. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form a substantially anti-reflective optical output coupler on a face of the active layer in order to promote emissions from the desired facet of the semiconductor laser.

37. Regarding claim 22, Zairi et al. discloses the steps of forming a metallic mount pad 96 over the substantially planar fiber mount region. Zairi et al. further discloses securing a metallized optical fiber 102 to the metallic mount pad 96 by the metal solder 100. See Paragraphs [0028], [0030] and [0036].

38. Regarding claim 23, Zairi et al. discloses that the fiber 102 may be bare, but does not expressly disclose the step of securing the fiber to the fiber mount pad by a glass solder. Glass solders are well known in the art as relatively low temperature solders. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to secure a fiber by a glass solder in order to provide ease of manufacture for a fiber-coupled device. Resultantly, it would additionally have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fiber mount pad that is configured to bond to a glass solder in order to provide proper adhesion between the glass solder and the substrate.

Response to Arguments

39. Applicant's arguments filed October 26, 2005 have been fully considered but they are not persuasive with regards to claims 2, 7-12, 18-20 and 24-26. Applicant states that Zairi et al. discloses the optical component mount region to be directly on the surface of the substrate, and therefore does not suggest the component mount aperture formed therein. Applicant also states that Koh et al. does not disclose or suggest the recited component mount aperture. Examiner respectfully disagrees.

40. Applicant further states that the present invention provides advantages because the component mount aperture is manufactured separately. However, it is noted that that feature is note recited in the claims. Applicant's claim 7, for example, recites "a substrate having an optical component mount aperture formed therein and a planar fiber mount region formed on the substrate…." The claimed invention does not recite an additional substrate or block, comprising the component mount aperture, that is separate from the main substrate.

41. Koh et al. clearly discloses a substrate comprising several component mount apertures 7a, 8a, 9a and 10a formed therein and configured to receive an optical component therein. The recesses of Koh et al. meet the claim limitation for, "an optical component mount aperture formed therein…and configured to receive an optical component therein." As such, Koh et al. was relied upon to modify the disclosure of Zairi et al., comprising a laser mounted on a surface of the substrate not comprising a component mount aperture, to provide the optical component mount aperture in the substrate of Zairi et al. to provide ease of placement of the laser.

42. Applicant's arguments with respect to claims 13-17 and 21-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Group Art Unit 2874